

ISS Onboard Virtual Reality Trainer (VRT)

Evelyn Miralles, L₃ Communications

Brian Mader, SGT, Inc.

NASA Johnson Space Center

Outline

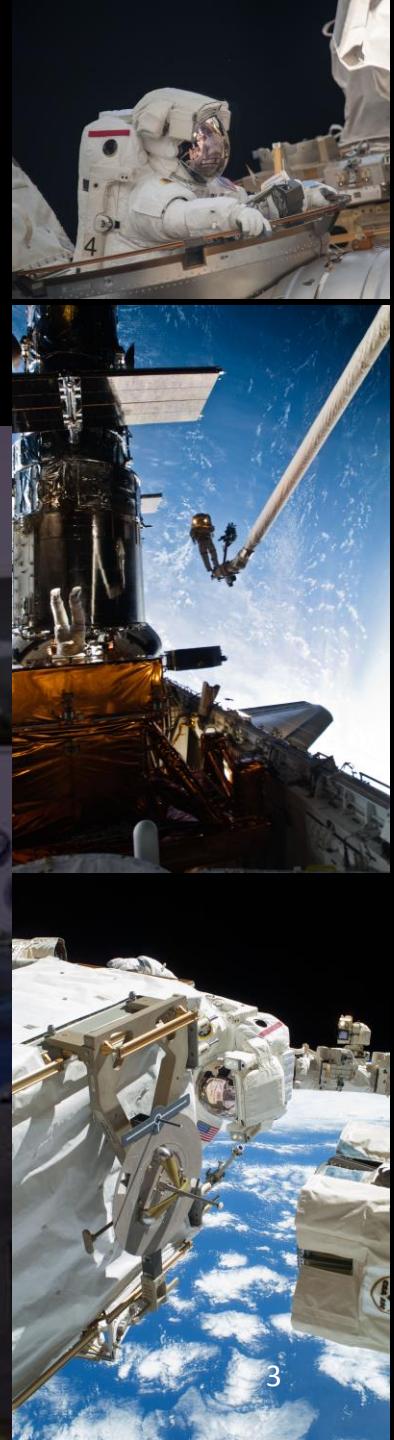
- Astronaut EVA training – past and present
- NASA JSC VRLab
- Why bring VR onboard ISS?
- VR Trainer design and implementation
- Future uses / improvements





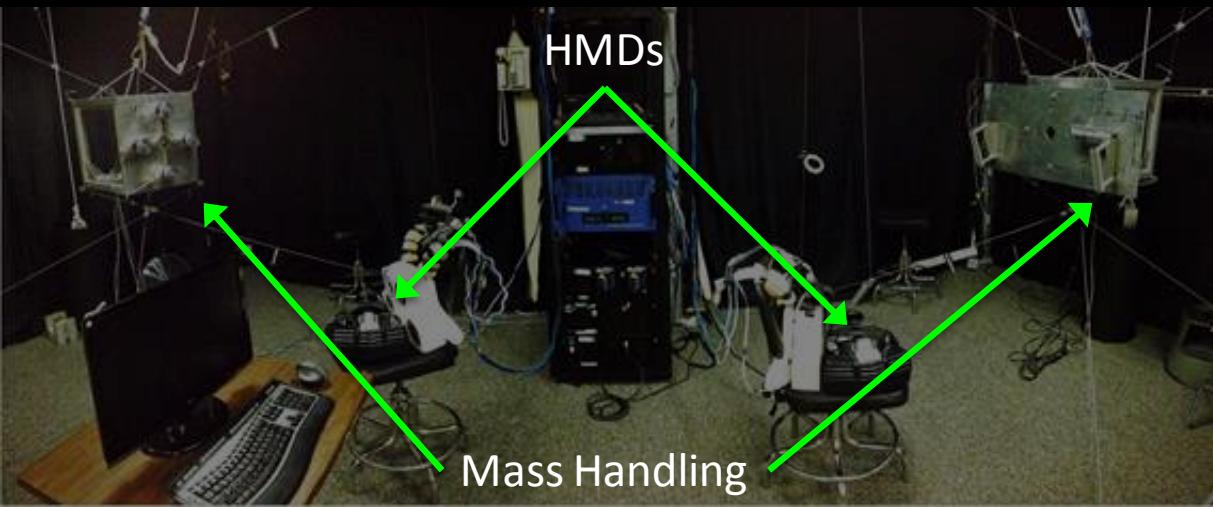
Astronaut EVA Training

- Space Shuttle
 - Crew assigned ~2 yr prior to flight
 - EVA crew selected near beginning of training
 - NBL training: task-specific
- ISS
 - Crew assigned ~2.5 yr prior to flight
 - EVAs scheduled as needed
 - NBL training: generic



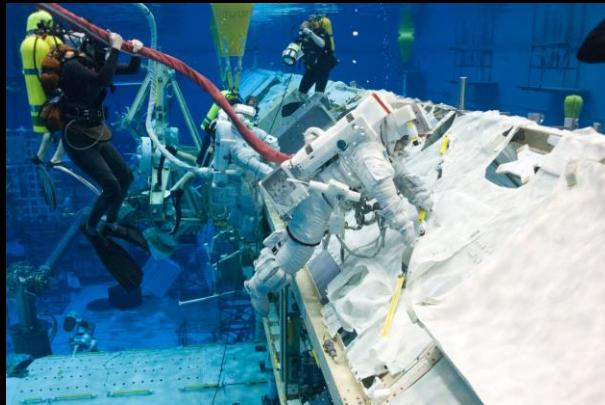
Training Astronauts - Virtually

- JSC VRLab established in 1990s, used for:
 - EVA Procedure Development
 - Simplified Aid for EVA Rescue (SAFER)
 - Robotics workstation training
 - Mass Handling



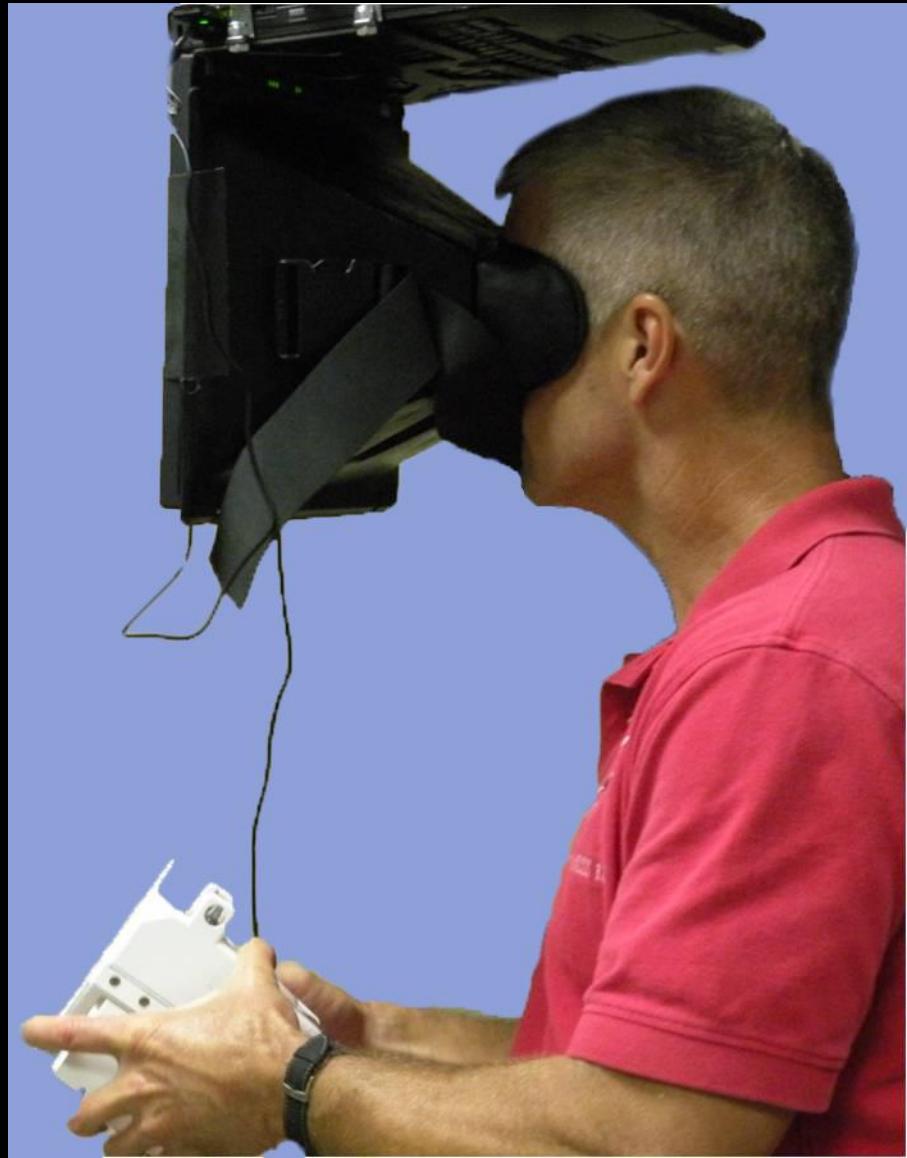
Why bring VR to ISS?

- For ISS training, astronauts have:
 - Less task-specific crew training
 - Longer time between training and actual EVA
- VR provides a 3D immersive environment to:
 - Reinforce existing training (proficiency/review)
 - Provide unique “views” of hardware/worksites not previously seen

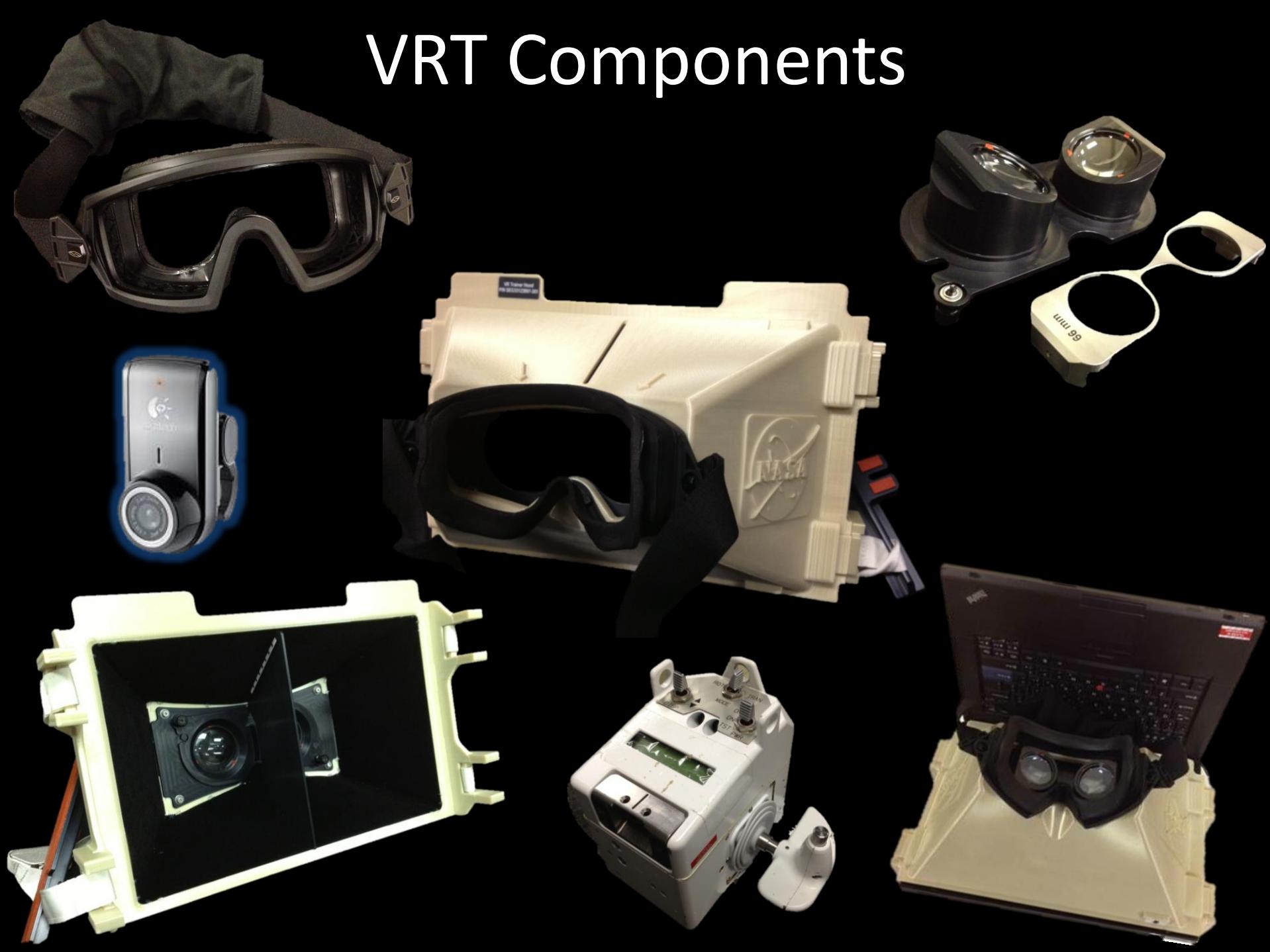


Designing the VR Trainer (VRT)

- Requirements:
 - Provide a 3D immersive experience on ISS
 - Utilize existing hardware/software to minimize certification time
- Design:
 - Provide a hood with integrated optics to attach to existing ISS laptops



VRT Components



Using the VRT

- Launched summer 2013 and has been used for training/proficiency prior to every US EVA since
 - Planned EVAs:
 - EVA 22, 23, 27, 28, 29, 30, 31
 - Contingency EVAs:
 - EVA 24, 25, 26



Future Applications

- Vision testing
- Updated hardware
- Crew psychological support
- ???



Reference

- 2014 JSC Research and Tech Report (p. 233): https://www.nasa.gov/sites/default/files/files/2014_Final_Rev1.pdf
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- Follow the VRLab: @vr_doug

